POLICY facts

U.S. DEPARTMENT OF ENERGY
NATIONAL ENERGY TECHNOLOGY LABORATORY

Strategic Center for Natural Gas

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MORE RESTRICTIVE REGULATION (HYDRAULIC FRACTURING) COULD IMPACT NATURAL GAS SUPPLY

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www.netl.doe.gov/scng

Description

Hydraulic fracturing is a widely practiced method for enhancing the flow of oil and natural gas from underground reservoirs into production wells. During fracturing operations, fluids are pumped down a well at very high pressures, which cracks open the hydrocarbon-bearing strata. High strength sand or other material is usually then pumped into the crack to prop it open. The resulting high permeability fracture increases flow from throughout the reservoir into the well. Low permeability and other unconventional formations, e.g., coals, are routinely fracture treated to bring flow rates to economical levels.

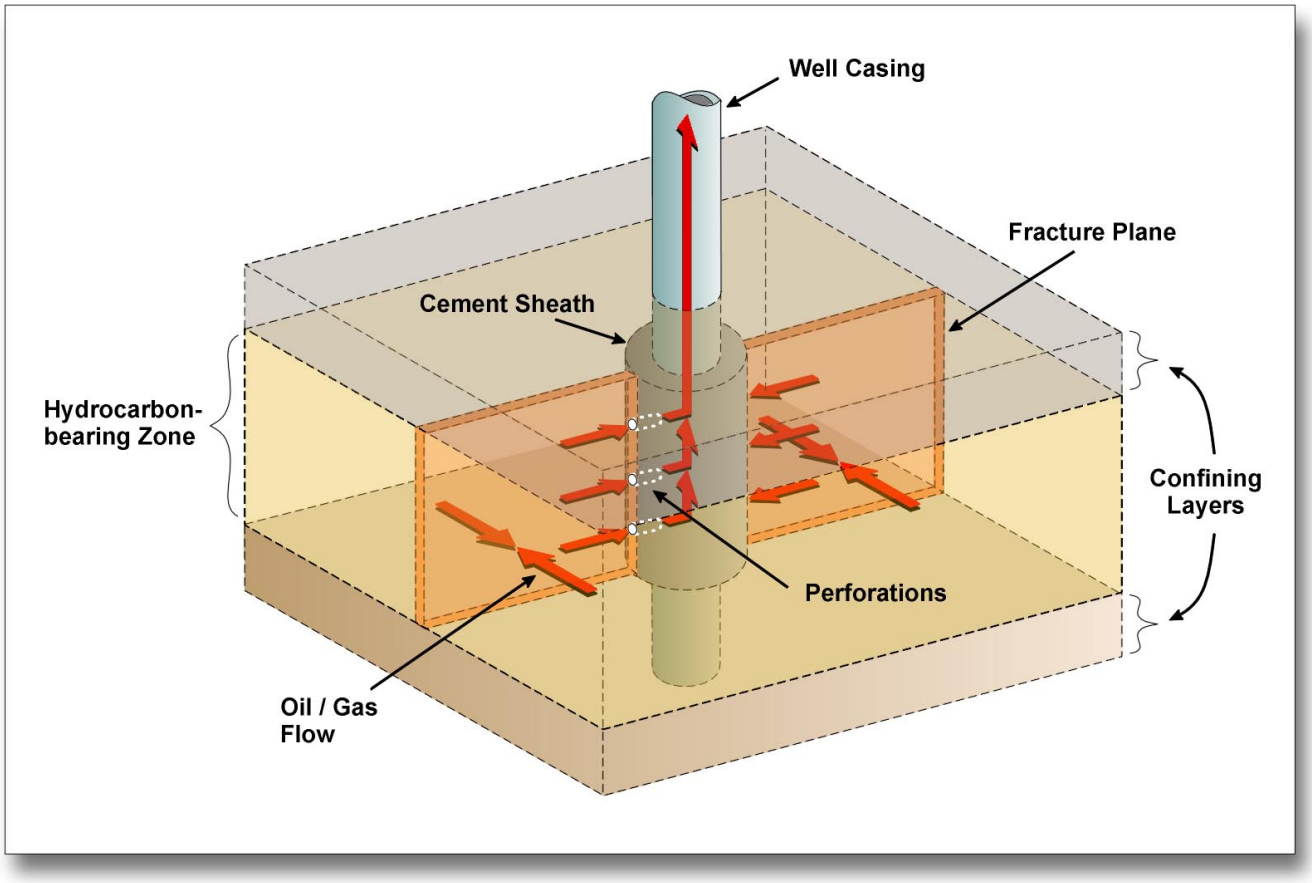
Well location during fracturing operations

NETL

Background

The U.S. Environmental Protection Agency (EPA) has held that hydraulic fracture stimulation of a production well does not fall under the purview of Underground Injection Control (UIC) regulations, which were issued in the early 1980's. In the not too distant past however, the Legal Environmental Assistance Foundation (LEAF) challenged the EPA's decision. Based on allegations of drinking water well contamination caused by coal seam fracturing operations in Alabama, LEAF contended that hydraulic fracturing for coalbed methane development should be regulated under UIC. EPA denied LEAF's original request, based on the findings of investigations by federal and state agencies.

Unsatisfied with EPA's determination, LEAF litigated. In 1997, the Eleventh Circuit Court of Appeals ruled that in Alabama, hydraulic fracturing of coals to enhance methane production should be subject to UIC regulations under the Safe Drinking Water Act (SDWA) (LEAF v. EPA, 118F. 3d 1467). The court ordered EPA to withdraw Alabama's UIC program or require the state to regulate hydraulic fracturing as underground injection. Alabama chose to modify its UIC program, and the EPA subsequently approved the state's revised program.



Fracturing increases oil/gas productivity and improves economics

Alabama's state-specific plan now requires that fluids used in fracturing operations comply with drinking water quality standards. In many instances, the water injected as base fracturing fluid exceeds the quality standards of water native to the gas-bearing strata (coal seams). Alabama has also had to increase and redirect resources, and create considerable administrative processes. Certifications are now required from well operators, well service companies, water trucking firms, and water suppliers. For pragmatic reasons, city water is now being used to fracture coals, and costs have increased for both the state and well operators. These costs are necessarily passed on, resulting in higher prices for consumers.

Even with Alabama's program modifications, some contend that underground sources of drinking water are still at risk, and litigation continues. EPA is studying the issue and the results of their investigation are expected to be available in fall-winter 2001. (See EPA's website for "Study Design for Evaluation of Impacts to Underground Sources of Drinking Water by Hydraulic Fracturing of Coalbed Methane Reservoirs." DOE is also investigating in order to provide a better understanding of the co-occurrence of producible coalbed methane and underground sources of drinking water. NETL's Strategic Center for Natural Gas (SCNG) continues to coordinate across federal groups and other organizations to further assess the impact of widespread regulation on the Nation's capability to develop and market natural gas.

Significance/Potential Impacts

More restrictive regulation of hydraulic fracturing, which may not increase the protection of underground drinking water, could have a deleterious effect on the supply of natural gas in the U.S — especially now, when the country is counting on natural gas to meet its growing energy requirements in an environmentally responsible manner.

The following apply:

- More stringent hydraulic fracturing regulations have increased Alabama's compliance costs. If these regulations are widely enacted, costs are expected to rise in all states.
- Industry is expected to challenge increased regulation, which will re-direct large sums of capital from E&P budgets to legal services.
- Currently, efforts are being directed towards reaching a legislative solution.
- Delays in issuing permits, and commensurate delays in well stimulation and gas marketing, can be expected.
- Cost increases associated with added regulation will drive up the wellhead cost of gas by at least a like amount; consequently, consumers will pay more for energy.
- Even the possibility of more restrictive regulation of hydraulic fracturing demands that additional Research and Development (R&D) funding be set aside for the advancement of technologies to offset potential increases in gas extraction costs.

More Restrictive Regulation (Hydraulic Fracturing) Could Impact Natural Gas Supply

RELEVANT INVOLVED PARTIES

U.S. EPA

States

The Oil and Gas Industry

Trade Organizations

Environmental Groups

RELATED LINKS

US Environmental Protection Agency UIC Program
www.epa.gov/safewater/uic.html

Interstate Oil and Gas Compact Commission
www.iogcc.state.ok.us/

Ground Water Protection Council
http://gwpc.site.net/

Alabama State Oil and Gas Board
www.ogb.state.al.us/

How SCNG is Addressing the Issue

The Strategic Center for Natural Gas (SCNG) has enhanced its dialog/coordination with industry and other agencies, and is providing technical input to EPA, especially in the areas of hydraulic fracture theory and numerical modeling/analysis. Staff will remain attentive to EPA's effort and will provide expert review of interim and final work products. Beyond the EPA sponsored investigation, SCNG is planning a study of the broad impacts to the gas industry should regulations similar to those enacted in Alabama become widely applicable, i.e., become applicable in other states and to other natural gas producing strata. The study, if commissioned, will consider the impacts to natural gas supplies in the U.S., including a review of well productivity, wellhead prices, delays in well completion, and the timeliness of gas marketing.